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ABSTRACT

Two nutrition education modules were developed on cardiovascular disease and fat-controlled diet consisting of a self-instruction leader's guide and teaching package to conduct learning sessions for the participants. The sessions consisted of an audio-visual presentation, situations related to the module topic, group discussion, role-playing, model-building, and food demonstrations. The modules were tested on health care personnel in sixteen Pennsylvania hospitals who were interested in learning about nutrition topics that were disease-related. The leaders and the participants, divided into treatment and nontreatment groups, took pretest and posttest measures to determine the effect of the sessions on cognitive performance. Background variables were examined to assess their effect on gain scores and questionnaires were used to obtain evaluative information on the modules. The self-instruction guides were effective in communicating nutrition information. The mean gains of the treatment group were significantly higher than the nontreatment group. Because of substantial background differences, the analysis focused on job categories showing differential pretest scores. When treatment was added to background variables a greater amount of variance in gain scores was explained. The questionnaires indicated the guides and sessions were well-received. Suggestions were made on the timing and scope of the presentations and future topic material. (Author/FP)

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THE DEVELOPMENT OF A MODEL FOR ADULT EDUCATION IN NUTRITION AND CARDIOVASCULAR DISEASE

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Two nutrition education modules were developed on cardiovascular disease and fat-controlled diet consisting of a self-instruction leader's guide and teaching package to conduct learning sessions for the participants. The sessions consisted of an audio-visual presentation, situations related to the module topic, group discussion, role-playing, model-building, and food demonstrations.

The modules were tested on health care personnel in sixteen Pennsylvania hospitals who were interested in learning about nutrition topics that were disease-related. The leaders and the participants, divided into treatment and nontreatment groups, took pretest and posttest measures to determine the effect of the sessions on cognitive performance. Background variables were examined to assess their effect on gain scores and questionnaires were used to obtain evaluative information on the modules.

The self-instruction guides were effective in communicating nutrition information. The mean gains of the treatment group were significantly higher than the nontreatment group. Because of substantial background differences, the analysis focused on job categories showing differential effects. Regression analysis indicated education most influencing pretest scores. When treatment was added to background variables a greater amount of variance in gain scores was explained. The questionnaires indicated the guides and sessions were well-received. Suggestions were made on the timing and scope of the presentations and future topic material.

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THE DEVELOPMENT AND EVALUATION OF A MODEL FOR ADULT EDUCATION IN NUTRITION AND CARDIOVASCULAR DISEASE

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One of the challenges nutrition educators face is how to translate nutrition information into a form that the general public will understand and utilize. It is often necessary for nutrition educators to put complex scientific information into language that can be easily comprehended by the public. Often, however, the challenge is not so much with providing the consumer with adequate nutrition information, as with finding an effective means of presenting the information. If nutrition education is to be successful, it must lead to the application of the information conveyed so that dietary practices support health and well-being.

Unfortunately, relatively little is known about how to influence nutritional beliefs and attitudes so that individuals will be motivated to adopt practices that are nutritionally sound. In addition, the number of trained nutrition educators is limited. Research is needed then, to develop and evaluate methods of effectively disseminating nutrition information as well as enhancing the outreach of the available nutrition educators. Meanwhile, the instructional effectiveness of those nutritionists and dietitians who have had little formal training in educational methodology, can be increased by providing them with validated teaching materials and guidance on the effective use of these.

The objective of this study was to develop and evaluate two educational modules for equipping professionals in foods and nutrition with adequate information and an effective means of presentation so that they could provide successful nutrition education sessions for their target audiences. Because dietary factors are strongly implicated in the development of heart disease, it is important that nutrition educators inform the public as to what these dietary factors are, and what can be done to modify them. For this reason, the topic of nutrition and cardiovascular disease was selected for the two modules developed. The two modules were I. Cardiovascular Disease and Nutrition, which dealt with the relationship between dietary factors and the development of heart disease; and II. The Fat-Controlled Diet, which provided guidelines for modifying the diet. Each module consisted of a self-instruction leader's guide and a teaching package to aid leaders in conducting learning sessions for their target audiences. These were designed for use by nutrition professionals who have had little or no formal training in education methodology, yet are in a situation where the potential for them to provide nutrition education is great. The learning sessions consisted of an audio-visual presentation, a discussion of situations related to the module topic, and three activities, which included group discussion, role playing, model building, and food demonstrations (Table 1). These activities were designed to actively involve the participants.

The modules were tested with personnel from sixteen Pennsylvania hospitals because continuing education in the form

of inservice training already existed in these hospitals, and because of their association with health care, these would likely be interested in learning about a nutrition topic that was disease-related. One person from each hospital acted as leader. In most cases, this was a registered dietitian. The leaders took a self-administered pretest before receiving the self-instruction guides, and a posttest after completing the self-instruction guide provided with each module. Participants in each hospital were assigned to treatment or nontreatment groups, with eight hospitals in each group. A pretest made up of items drawn from both modules was administered to all participants by the leader. One learning session was conducted per week during the following two weeks. A posttest composed of pretest items specific to each module was administered to the nontreatment group immediately prior to each session, and to the treatment group immediately after each session.

Background information collected on the participants revealed that the two groups differed significantly. The treatment group (n=154) tended to be younger and better educated; more held professional jobs and had been at their present job for a shorter period of time than the nontreatment group (n=117).

The self-instruction leader's guide was shown to be effective in communicating nutrition information. The leaders scored significantly higher on posttest than on pretest ($p<0.001$), exhibiting gains of 26% and 14% on Modules I and II, respectively (Table 2). This indicated that the leaders were able to assess information pertinent to conducting the learning sessions from

the leader's guide. The mean gains (posttest - pretest score) of the treatment group participants were significantly greater than those of the nontreatment group ($p<0.001$) (Table 3). However, because the background characteristics of the two groups differed, they were subdivided according to job categories, and the cognitive performances of the participants were examined on that basis. Treatment and nontreatment participants were combined for purposes of comparing the prescores of those in the various job categories. Dietitians and registered nurses had higher entry level knowledge than participants in most other job categories, and food service personnel had lower.

Treatment group food service workers and hospital staff had significantly greater gains than the nontreatment group participants in those job categories on both Modules I and II (Tables 4 and 5). Treatment-group licensed practical nurses had significantly higher gains on Module I than nontreatment ones, and treatment-group food service supervisors had significantly greater gains on Module II than nontreatment group participants with those jobs. Gains of treatment-group dietitians, diet aides and registered nurses were not significantly different than nontreatment-group participants in comparable job categories. Health care professionals and student nurses were not represented in the nontreatment group, so a comparison of gains between groups was not possible. However, participants in these job categories in the treatment group did show significant gains ($p<0.01$) from pretest to posttest on both Modules I and II.

Multiple regression analyses were used to further examine the effect of the background variables on pretest and gain

(posttest vs pretest scores). A significant, positive correlation existed between education (last grade completed) and performance on the pretest, indicating that those individuals with more formal education scored higher on the pretest. However, in the case of both modules, education had no significant influence on gain. In fact, the five variables examined (age, sex, number of nutrition courses taken, last grade completed, and amount of time at the present job) accounted for only 1% and 3.5% of the variance in Module I and Module II test score gain, respectively. When the treatment (experiencing the session prior to the posttest) was added to the regression equation, 7% and 14% of the variance in gain in test scores was explained. These increases were significant for both modules ($p<0.001$). These results support the conclusion that the modules did significantly enhance the learning of many participants in the treatment group.

Questionnaires containing five-point rating scales were used to obtain evaluative assessment of the modules. The leaders rated the self-instruction guides favorably and indicated that the guides were both interesting and helpful in providing them with information to conduct the learning sessions. Participants responded favorably to the learning sessions. Modules I and II were rated as "good" to "excellent" by 77% and 78% of the participants, respectively. Of the activities conducted, those that involved group discussions were more highly rated than those which involved model building or food demonstrations. The only major criticism of

of the learning sessions dealt with time. Leaders commented that two-hour sessions were not practical for hospital time schedules. The registered nurses indicated a desire for more in-depth information on the topics. Topics suggested for future nutrition programs for hospital personnel were hypertension, diabetes, and weight reduction.

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Table 1

Activities Included in the Teaching Packages

MODULE I: Cardiovascular Disease and Nutrition

Activity A - Risk Factors

description - involved small group discussion of the effects of particular risk factors on the development of heart disease

support materials - assignment sheets with instructions for the small group discussions

Activity B - Fats and Atherosclerosis

description - small groups built models which demonstrated the molecular structures of saturated, monounsaturated and polyunsaturated fats, and the build-up of fat inside an artery

support materials - assignment sheets; cardboard discs, pipe cleaners; 4" diam. plastic tubing (artery), modeling clay

Activity C - Hidden Fats

description - leader demonstrated the visible and invisible fats in foods

MODULE II: The Fat-Controlled Diet

Activity A - Role Playing

description - small groups helped a "friend" select low-fat foods for a special purpose (i.e., a particular recipe) using food lables

support materials - assignment sheets, food lables or pictures

Activity B - Cooking Demonstration

description - pairs shared helping each other select low-fat foods by reading the list of ingredients on food labels

support materials - food labels

Activity C - Cooking Demonstration

description - leader demonstrated preparation techniques for low-fat foods

support materials - recipe packet for participants

Table 2

Leaders' Performance on Pre- and Posttest
(n=16)

Module	PRETEST Mean ± Standard	POSTTEST Deviation	T-value
I[a]	22.62 ± 2.8	28.62 ± 2.2	9.20***[b]
II[c]	35.25 ± 6.4	40.32 ± 6.4	3.20**[d]

[a]Total number of points on both pre- and posttests in Module I = 32.

[b]***mean differences significant at $p<0.001$.

[c]Total number of points on both pre- and posttests in Module II = 45.

[d]**mean differences significant at $p<0.01$.

Table 3

Mean Test Scores and Gains of Participants

	TREATMENT GROUP (n=154) mean ± standard deviation	NONTREATMENT GROUP (n=117) mean ± standard deviation	T-value[a]
Module I[b]			
Pretest	17.83 ± 4.2	15.82 ± 4.6	3.63***
Posttest	21.00 ± 2.6	17.20 ± 4.8	7.55***
Gain	3.17 ± 3.7	1.38 ± 3.6	4.14***
Module II[c]			
Pretest	19.58 ± 4.6	19.31 ± 4.3	0.49
Posttest	24.31 ± 2.4	20.99 ± 4.2	7.64***
Gain	4.73 ± 4.7	1.68 ± 3.6	6.06***

[a]T-values which were significant by ***, $p<0.001$.

[b]Total number of points on both pre- and posttests in Module I = 25.

[c]Total number of points on both pre- and posttests in Module II = 26.

Table 4

Mean Module I Test Scores and Gains
of Participants by Job Category[a]

Job Category[b]	PRETEST		POSTTEST		GAIN	
	Treatment	Nontreatment	Treatment	Nontreatment	Treatment	Nontreatment
Dietitians	21.33±2.1	18.25±3.9	22.50±0.8	21.00±2.0	1.17±1.7	2.75±3.3
Diet Aides	17.20±4.1	16.00±5.2	21.40±2.1	18.30±5.3	4.20±4.3	2.50±4.0
Food Service Supervisors	15.48±3.2	15.09±4.0	19.81±3.5	17.71±2.8	4.33±5.1	2.62±4.4
Food Service Workers	16.56±5.0[c]	14.09±4.6[c]	20.47±2.9	14.55±4.4	3.91±3.6[d]	0.46±3.1[d]
Registered Nurses	20.88±2.4	19.79±2.7	22.31±1.7	22.50±1.5	1.42±2.0	2.71±2.9
Licensed Practical Nurses	16.62±3.4	18.83±3.3	19.88±2.7	19.33±3.4	3.25±2.5[c]	0.50±3.3[c]
Student Nurses	17.59±4.74		20.78±2.38		3.17±4.21	
Other Health Care Workers/Professionals	19.00±2.37		21.60±1.54		2.60±1.48	
Hospital Staff	16.40±4.25	20.80±2.43	21.10±3.21	19.40±2.22	4.70±2.83[c]	-1.40±3.21[c]

[a]The highest possible score on the pre- and posttest was 25. Each pair of means in horizontal columns that bear like subscripts are significantly different.

[b]The number of participants in each job category in the treatment and nontreatment group, respectively was: dietitians 6 and 4; diet aides 5 and 10; food service supervisors 21 and 21; food service workers 32 and 56; registered nurses 26 and 14, licensed practical nurses 8 and 6, hospital staff 9 and 5. Student nurses and other health care workers/professionals were represented only in the treatment group, containing 27 and 15 participants, respectively.

[c]$p<0.05$. [d]$p<0.01$.

Table 5

Mean Module II Test Scores and Gains
of Participants by Job Category[a]

Job Category	PRETEST		POSTTEST		GAIN	
	Treatment	Nontreatment	Treatment	Nontreatment	Treatment	Nontreatment
Dietitians	24.67±2.3[c]	20.50±4.2[c]	25.17±1.0	22.75±3.6	0.5±2.8	2.25±5.2
Diet Aides	21.60±3.2	20.50±5.5	23.00±1.6	21.50±5.4	1.40±2.3	1.00±2.5
Food Service Supervisors	19.57±4.4	20.09±3.7	24.76±2.1	21.6±3.6	5.19±3.7[d]	1.43±3.5[d]
Food Service Workers	18.53±3.1	18.04±4.5	24.38±2.8[e]	19.91±4.2[e]	5.84±4.4[e]	1.88±3.0[e]
Registered Nurses	22.88±3.0	20.07±3.7	25.08±1.7[d]	22.64±3.0[d]	2.19±2.9	2.57±4.9
Licensed Practical Nurses	17.25±4.4	19.83±3.5	22.50±2.8	21.17±5.6	5.25±5.3	1.33±2.3
Student Nurses	17.41±5.2		23.59±2.4		6.14±5.6	
Other Health Care Workers/Professionals	19.40±3.2		24.30±2.5		4.90±4.2	
Hospital Staff	17.20±5.2	22.20±1.4[c]	24.60±2.6	24.40±0.2	7.4±5.3[c]	2.20±1.2[c]

[a]The highest possible score on the pre- and posttest was 26. Each pair of means in horizontal columns that bear like subscripts are significantly different.

[b]The number of participants in each job category in the treatment and nontreatment group, respectively was: dietitians 6 and 4; diet aides 5 and 10; food service supervisors 21 and 21; food service workers 32 and 56; registered nurses 26 and 14, licensed practical nurses 8 and 6, hospital staff 9 and 5. Student nurses and other health care workers/professionals were represented only in the treatment group, containing 27 and 15 participants, respectively.

[c]$p < .05$. [d]$p < .01$. [e]$p < .001$.